MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2021/2022

BFN2254 – FINANCIAL STATISTICAL ANALYSIS

(All sections / Groups)

15 AUGUST 2022
9.00 a.m. - 11.00 a.m.
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **6 pages** with **4 questions** only excluded the cover page.
2. Attempt **ALL** questions and write your answers in the Answer Booklet provided.
3. Students are allowed to use non-programmable scientific calculators that are permitted to be used in the examination.

Question 1 [20 Marks]

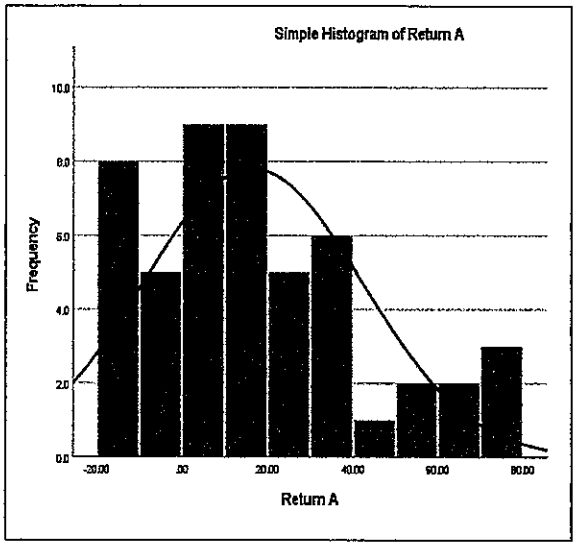
Suppose that Elisha is facing a decision about where to invest the earnings she gained from her part-time job. Her friend has suggested two types of investment funds which are Fund A and Fund B.

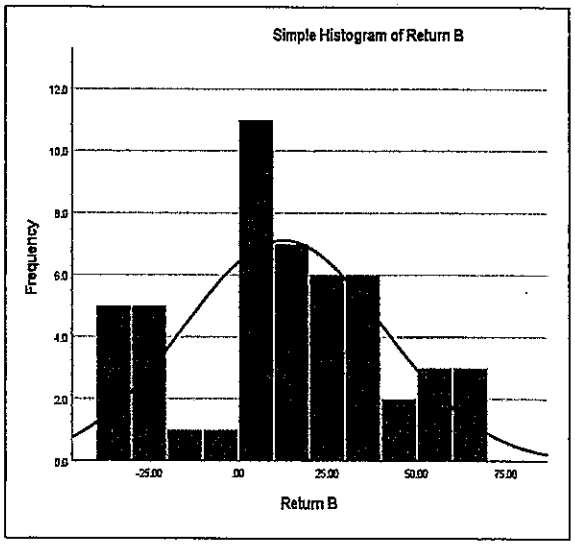
Below are the SPSS outputs generated from the returns (in percentage) for the two types of investment funds.

Statistics

		Return A	Return B
N	Valid	50	50
	Missing	0	0
Mean		16.5146	12.7602
Median		12.7850	10.7550
Mode		12.89	-38.47[a]
Std. Deviation		25.57244	28.04676
Skewness		1.136	.011
Std. Error of Skewness		.337	.337
Kurtosis		-.163	-.618
Std. Error of Kurtosis		.662	.662
Range		96.31	106.47
Minimum		-19.27	-38.47
Maximum		77.04	68.00
Sum		825.73	638.01

a. Multiple modes exist. The smallest value is shown





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a) Interpret the values of mean, median and skewness coefficients of the investment return for both funds. [8 marks]

b) Based on the standard deviation values, which type of fund make the investment riskier with wider spread? Explain. [3 marks]

c) By visualizing the histograms,
   i. Are both samples normally distributed? Explain. [4 marks]
   ii. Is there any kurtosis issue for both dataset? Explain [2 marks]

d) From the statistical findings, which investment fund would you choose? Explain the reasons of your choice. [3 marks]

Question 2 (25 Marks)

a) In a study of credit card use, the company would like to know who their customers are and how they became customers. Random samples were drawn of cardholders who applied for the credit card and credit cardholders who were contacted by telemarketers or by mail. The total purchases made by each last month were recorded and analyzed as below. Assume that,
Group 1 (Applied)-Total purchases made by cardholders who applied by themselves
Group 2 (Contacted)-Total purchases made by cardholder who applied cause contacted by telemarketers or by mail

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Contacted	Statistic	df	Sig.	Statistic	df	Sig.
Total Purchases	Applied	.087	100	.062	.980	100	.124
	Contacted	.068	100	.200*	.992	100	.827

		Levene's Test for Equality of Variances		t-test for Equality of Means			
						Significance	
		F	Sig.	t	df	One-Sided p	Two-Sided p
Total Purchases	Equal variances assumed	1.171	.281	.941	198	.174	.348
	Equal variances not assumed			.941	192.668	.174	.348

   i. Does the data involve independent or dependent samples? Justify your answer. [2 marks]
   ii. Does the data follow a normal distribution? [4 marks]
   iii. Does the data fulfill the assumption of homogeneity of variances? [5 marks]
   iv. At 5% level of significance, can we conclude that differences exist on average of total purchases made between the two types of customers?
   Note: The procedure of checking assumptions is not necessary. [7 marks]

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b) The Dow-Jones Transportation Average is calculated based on the closing prices of the common stocks of 20 airlines, rail, and freight companies. An extreme airplane crash incident has occurred on 23rd May 2018 which assumed will affect the stock prices negatively. In investigating the impact, the closing prices for all the 20 companies have been compared before the incident (21st May 2018) and after the incident (24th May 2018).

i. Does the data involve independent or dependent samples? Justify your answer. [2 marks]

ii. Given that the differences data values are badly skewed. Determine the most appropriate hypothesis testing technique in finding evidence supporting assumption of the closing stock prices have declined after the incident. [2 marks]

iii. State the reasons of your choice in (ii). [3 marks]

Question 3 (25 Marks)

a) What is the nonparametric counterpart for one-way ANOVA test? State the advantages and disadvantages of applying its non-parametric test compared to one-way ANOVA. [5 marks]

b) A small independent stockbroker has created four sector portfolios for her clients. Each portfolio always has ten stocks that may change from year to year. The volatility (coefficient of variation) of each stock is recorded for each year. The predictions are recorded and analyzed. The following output were generated from the data analysis:

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	PortfolioType	Statistic	df	Sig.	Statistic	df	Sig.
Volatility	Health	.156	10	.200*	.934	10	.490
	Energy	.248	10	.082	.858	10	.073
	Retail	.161	10	.200*	.958	10	.762
	Leisure	.222	10	.179	.863	10	.084

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Volatility	Based on Mean	.574	3	36	.636
	Based on Median	.244	3	36	.865
	Based on Median and with adjusted df	.244	3	32.479	.865
	Based on trimmed mean	.524	3	36	.669

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ANOVA

Volatility

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	175.719	3	58.573	3.204	.035
Within Groups	658.131	36	18.281		
Total	833.850	39			

(I) PortfolioType	(J) PortfolioType	Mean Difference (I-J)	Std. Error	Sig.
Health	Energy	-5.8000*	1.9121	.004
	Retail	-1.8500	1.9121	.340
	Leisure	-2.4000	1.9121	.218
Energy	Health	5.8000*	1.9121	.004
	Retail	3.9500*	1.9121	.046
	Leisure	3.4000	1.9121	.084
Retail	Health	1.8500	1.9121	.340
	Energy	-3.9500*	1.9121	.046
	Leisure	-.5500	1.9121	.775
Leisure	Health	2.4000	1.9121	.218
	Energy	-3.4000	1.9121	.084
	Retail	.5500	1.9121	.775

i. At the 5 percent level of significance, is there evidence of a difference in the mean volatility across the four portfolio types? Show the procedure of checking assumptions too. [13 marks]

ii. From the LSD post-hoc test above, which type of portfolio significantly differ in mean of volatility? Use p-value approach with 10% significance level. [7 marks]

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Question 4 (30 Marks)

a) The sales of smartphones with larger screen is increasing in Malaysia. As for the first quarter of 2019, 24% from the total smartphone market sales is smartphones with screens 4 inches or larger. 40% for smartphones with screens between 3.5 and 3.9 inches and the smartphones with screens less than 3.5 inches has declined to 36%.

A sales manager of a smartphone company has conducted a survey on 148 universities student smartphone users and the following analysis outputs have been obtained.

Frequency Table: ScreenSizes

	Observed N	Expected N	Residual
4 inches or greater	30	35.5	-5.5
Between 3.5 to 3.9	75	59.2	15.8
Less than 3.5 inches	43	53.3	-10.3
Total	148		

Test Statistics

	ScreenSizes
Chi-Square	7.058[a]
df	2
Asymp. Sig.	.029

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 35.5.

i. Based on the outputs, does smartphone ownership by universities students identical to the national distribution? Use 5 percent significance level. [7 marks]

ii. From the frequency table, discuss on the frequency differences of smartphone preferences between university students and national smartphone users? [3 marks]

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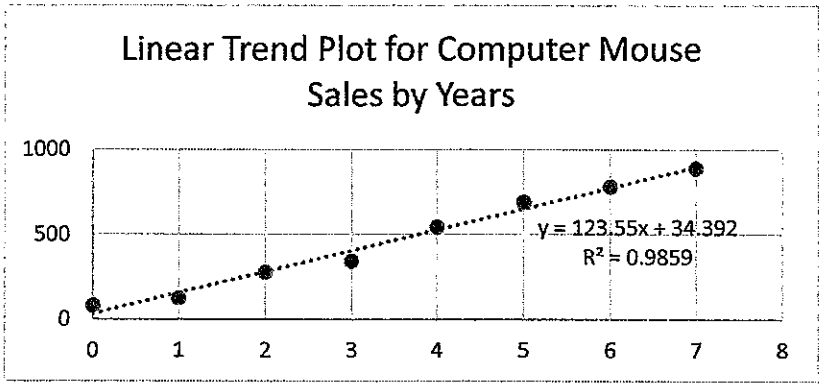
b) Richard developed an ergonomically superior computer mouse in 2012, and sales have been increasing ever since. Data are presented below lists the number of computer mouse sold (in thousands unit) per year from 2012 to 2019.

Year	2012	2013	2014	2015	2016	2017	2018	2019
No sold	82.4	125.7	276.9	342.5	543.6	691.5	782.4	889.5



i. Fit a three-year moving average to the data. [6 marks]

ii. Using a smooth coefficient of W=0.25, exponentially smooth the series. [7 marks]

iii. What is your exponentially smoothed forecast for 2020? [2 marks]

iv. From the trend plot above, what conclusions can you reach on the sales of computer mouse during the period above. [3 marks]

v. Make forecasts for number of computer mouse sold for 2022 and 2024 from the linear trend model given on the plot. [2 marks]

Note: Use one decimal places for all values.

End of Question.